

## **CLAIMS**

1. A method of obtaining instructions for routing a packet comprising:

receiving a packet having a packet flow identifier that includes a packet  
source IP address, a packet destination IP address, a packet source port, and a packet  
5 destination port;

checking whether the packet flow identifier matches a stored instruction;

if the packet flow identifier does not match a stored instruction, checking  
whether the packet flow identifier matches a stored criteria; and

if the packet matches a stored criteria, forwarding the packet to a service  
10 manager.

2. A method of obtaining instructions as recited in claim 1 further including:

receiving an instruction from the service manager, the instruction  
including an instruction flow identifier used to identify packets to which the instruction is  
to be applied; and

15 checking whether the instruction flow identifier matches a stored criteria.

3. A method of obtaining instructions as recited in claim 2 further including rejecting the instruction if the instruction flow identifier does not match the stored criteria.
4. A method of obtaining instructions as recited in claim 2 further including storing  
5 the instruction if the instruction flow identifier matches the stored criteria
5. A method of obtaining instructions as recited in claim 1 further including:
- receiving an instruction from the service manager, the instruction including actions used to route packets to which the instruction is applied; and
- checking whether the actions are supported.
- 10 6. A method of obtaining instructions as recited in claim 5 further including rejecting the instruction if the action is not supported.
7. A method of obtaining instructions as recited in claim 5 further including storing the instruction if the action is supported.
8. A method of obtaining instructions for routing a packet as recited in claim 1  
15 further including periodically checking an expiration time associated with the stored instruction and deleting the stored instruction when the expiration time arrives.
9. A forwarding agent comprising:
- a packet receiving interface configured to receive a packet having a packet flow identifier that includes a packet source IP address, a packet destination IP  
20 address, a packet source port, and a packet destination port;

a processor configured to check whether the packet flow identifier matches a stored instruction and if the packet flow identifier does not match a stored instruction, checking whether the packet flow identifier matches a stored criteria; and

5 a packet forwarding interface for forwarding the packet to a service manager if the packet matches a stored criteria.

10. A network service manager comprising:

a set up interface for specifying a set of packets for which the service manager will provide a network service.

10 a forwarding agent communication interface on which packet interest instructions can be multicast to a plurality of forwarding agents for the purpose of instructing the plurality of forwarding agents to send certain packets in the set of packets to the service manager;

15 a packet receiving interface on which the service manager can receive packets sent from a reporting forwarding agent in response to the multicast packet interest instructions;

a processor for processing the packet received on the packet receiving interface and for determining an action for the reporting forwarding agent to take regarding the packet.

11. A network service manager as recited in claim 10 further including a packet forwarding interface on which the service manager can forward the packet received on the packet receiving interface back to the reporting forwarding agent along with the action determined for the forwarding agent to take regarding the packet.

12. A network service manager as recited in claim 10 wherein the forwarding agent communication interface forwards the packet received on the packet receiving interface

back to the reporting forwarding agent along with the action determined for the forwarding agent to take regarding the packet.

13. A network service manager as recited in claim 10 further including an outside interface on which the service manager can forward the packet received on the packet receiving interface to a destination determined by the processor.

14. A method of processing a packet at a router comprising:

receiving a packet having packet flow identifier that includes a packet source IP address, a packet destination IP address, a packet source port, and a packet destination port;

- checking whether the packet flow identifier matches a general filter;

checking whether the packet flow identifier matches a specific filter;

if the packet flow identifier does not match the specific filter but does match the general filter, sending the packet to a service manager indicated by the general filter.

15. A method of synchronizing packet handling instructions from a service manager to a router including:

sending an interest filter to the router, the interest filter specifying a plurality of flows for which packets are to be sent to the service manager;

receiving a requested packet corresponding to a specific one of the flows;

- determining actions to be applied to the specific one of the flows; and

sending an action filter to the router that specifies an action to be performed for each packet in the specific one of the flows.

16. A method of synchronizing packet handling instructions from a service manager to a router as recited in claim 15 wherein the interest filter includes an expiration time at  
5 which the interest filter is no longer to be used.

17. A method of synchronizing packet handling instructions from a service manager to a router as recited in claim 15 wherein the action filter includes an expiration time at which the interest filter is no longer to be used.

18. A computer program product for obtaining instructions for routing a packet, the  
10 computer program product being embodied in a computer readable medium and comprising computer instructions for:

receiving a packet having a packet flow identifier that includes a packet source IP address, a packet destination IP address, a packet source port, and a packet destination port;

15 checking whether the packet flow identifier matches a stored instruction;

if the packet flow identifier does not match a stored instruction, checking whether the packet flow identifier matches a stored criteria; and

if the packet matches a stored criteria, forwarding the packet to a service manager.

19. A computer program product for processing a packet at a router, the computer program product being embodied in a computer readable medium and comprising:

receiving a packet having packet flow identifier that includes a packet source IP address, a packet destination IP address, a packet source port, and a packet destination port;

checking whether the packet flow identifier matches a general filter;

checking whether the packet flow identifier matches a specific filter;

if the packet flow identifier does not match the specific filter but does match the general filter, sending the packet to a service manager indicated by the general filter.

20. A computer program product for synchronizing packet handling instructions from a service manager to a router, the computer program product being embodied in a computer readable medium and comprising:

sending an interest filter to the router, the interest filter specifying a plurality of flows for which packets are to be sent to the service manager;

receiving a requested packet corresponding to a specific one of the flows;

determining actions to be applied to the specific one of the flows; and

sending an action filter to the router that specifies an action to be performed for each packet in the specific one of the flows.

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